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Quality of life and its effective factors in tuberculosis patients receiving directly observed treatment short-course (DOTS)

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ABSTRACT

Background: Quality of life in patients affected with chronic diseases has developed into a therapeutic objective as the best tool to evaluate response to treatment and medical care. The purpose of this study was to evaluate quality of life and its related factors in tuberculosis patients receiving directly observed treatment short-course in Iran.

Methods: This was a cross-sectional research with a descriptive-analytic design. Sample size included 71 patients affected with tuberculosis based on census method; so that, at the time of the study, all the tuberculosis patients were recruited in this research. The data collection instrument was a questionnaire comprised of two parts including demographic characteristics information and standard 36-Item Short Form Health Survey (SF-36). The data were also analyzed using SPSS Statistics along with descriptive and analytic statistics and independent t-tests, analysis of variance (ANOVA), and Chi-square test.

Results: The lowest mean score was 63.58 ± 10.16 and 62.82 ± 15.2 related to limited physical activity following mental problems and social functioning, respectively. Furthermore, the findings of the independent *t*-test demonstrated that the mean scores of quality of life among men and women, those with pulmonic and non-pulmonic tuberculosis, patient's place of residence and the stage of treatment were statistically and significantly different.

Conclusion: According to the above results, tuberculosis and its treatment have impact on the social function, mental, and emotional aspects of the quality of life of patients, Attention to and monitoring of the quality of life as a follow up of the treatment and care intervention in these patients is necessary.

1. Introduction

There is an ever-increasing interest in evaluating and improving quality of life among patients with chronic diseases. As a result, improved daily functioning and quality of life (QOL)[1] in such individuals has turned into a therapeutic objective [1]. Additionally, health care providers have realized that considering the physical aspects of the disease alone is not suffice by itself and that the best and the most effective treatments should be advocated to help patients achieve a normal life, with QOL being considered as one of the variables [2]. Moreover, results of clinical trials have shown that QOL can be used as an indicator of the quality of health care services and a part of the treatment plan for patients such that its evaluation in the domain of chronic diseases can provide of heath care providers with more information about patients' health status and serve as a useful guide to improve the quality of treatment and care services [3]. Today, QOL is increasingly used to evaluate patient care outcomes rather than traditional criteria such as mortality and illness [3]. Studies have shown that quality of life in chronic diseases is associated with a lot of changes; therefore, in most patients with chronic disease, many aspects of quality of life are disturbed [4].

In this respect, tuberculosis is considered as one of the illnesses that can seriously undermine QOL [5]. The factors that have been cited as most important in influencing QOL in patients affected with TB, have been long-term treatment; multi-drug therapy; toxic reactions and side effects of medications; adherence to drug regimen; social impacts; social support; social acceptance of the illness; family; changes in lifestyle; patients' marital status; extent of access to health care services; socio-economic status; patients' and their family's knowledge of the illness, treatments; as well as complications of tuberculosis [6-8]. Currently,

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[1] Quality of life

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tuberculosis management strategy is based on preventing mortality and avoiding morbidity. Quality of life monitoring is the best method for achieving this goal [9].

Tools with the potential to evaluate health status in all dimensions have become of great interest in epidemiological studies [10]. In this respect, the standard 36-Item Short Form Health Survey (SF-36)[2] has proven effective in clinical applications, evaluation of health research policies, and population-based studies as it is not related to specific age groups, communities, and diseases but evaluates two dimensions of a person's physical and mental health status [11,12]. This questionnaire also considers health status related to QOL, including multiple dimensions (physical, mental, and social) and has emerged as a useful tool in reporting the outcomes of therapeutic and care-related indicators [13].

Assessing QOL is a good response and an effective factor in expressing the level and outcome of health [11]. In patients with pulmonary diseases, this survey questionnaire has been shown to be a good tool for evaluating response to treatment and proper physiological functioning of the respiratory tract [14].

Since maximizing QOL is one of the main goals of tuberculosis treatment and care, health care providers and researchers need more information, as the first step, about QOL, its related factors, and how to promote it. Therefore, the purpose of this study was to evaluate QOL and related factors in patients receiving directly observed treatment short-course (DOTS).

2. Research method

The present study was a cross-sectional study with a descriptive-analytic design, approved by the Ethics Committee affiliated with the Shahrekord University of Medical Sciences (IR.SKUMS.REC.716). Study subjects included all patients with tuberculosis undergoing DOTS treatment (70 persons) at the time of the study,. All of the patients were from a province with mountainous weather and unsuitable economic conditions. In Iran, healthcare is managed by the health authorities of each province and is independent of other provinces.

The data collection instrument was a questionnaire consisting of two parts including demographic characteristics, medications used, duration of treatment, type of tuberculosis (pulmonary and extra-pulmonary), and illness case (new or recurrence) and Quality of Life Questionnaire(SF- 36). This questionnaire has 36 question that were designed by War and et al. in 1991 and measures QOL in 8 dimensions: physical function, limited physical activity following mental problems, limited physical activity following physical problems, vitality and fatigue, mental health, social functioning, bodily pain, and general health. The QOL score in each dimension is graded from 0–100, with 0 indicating the lowest QOL and 100 indicating the highest quality of life [15]. In another classification, grades from 0 to 49 are classified as undesirable, 50–74 as relatively favorable, 75 and above as desirable [16]. After registering the patients' complete profile from their medical records in the Tuberculosis Center of Chaharmahal and Bakhtiari Province, the researchers visited patients at their homes with the full coordination of the relevant Health Center and completed the demographic characteristics questionnaire, the SF-36 questionnaire, and other required information. The data were analyzed using SPSS Statistics along with descriptive and inferential statistical tests via independent *t*-test, ANOVA, and Chi-square test.

3. Results

Form the total number of 71 patients who entered the study, 53.1% were male and 46.9% were female, 89.1% had Iranian nationality, and 10.9% of them were foreigners. In terms of place of residence, 76.6% of the patients were living in urban areas and 23.4% of them resided in rural ones. As regards their tuberculosis diagnosis 60.9% of these individuals were suffering from pulmonary tuberculosis and 39.1% of them were affected with extra pulmonary tuberculosis. In addition, 93.2% of the patients were diagnosed as new cases and 6.8% of them were classified as recurrent tuberculosis cases.

The mean standard deviation (SD) of age of the patients was 51.11 ± 21.25 years and the mean duration of treatment was 7.47 ± 2.37 months. The mean scores for 8 dimensions of quality of life in patients are illustrated in Table 1. The results of the ANOVA analysis showed a significant relationship between the duration of treatment and the total QOL score; patients experiencing their third trimester of treatment had lower mean scores. Women, patients who live in urban areas and patients with extra pulmonary tuberculosis had a significantly higher mean QOL scores than men, patients living in rural areas and patients with pulmonary tuberculosis (Table 2).

4. Discussion

Compared to the results of the study, khoohi et al., The average quality of life of the majority of people in some countries was 74.26 [17], therefore the results of the present study indicate that the mean QOL scores among tuberculosis patients undergoing DOTS in Chaharmahal and Bakhtiari Province were much lower than the normal range. Furthermore, patients who were in the last stage of treatment had a lower mean QOL score as had men, patients living in rural areas and patients with pulmonary tuberculosis.

Relatively few investigations had been conducted on QOL in tuberculosis patients [8]. In the study by Adeyeye et al., the mean QOL scores in patients with pulmonary tuberculosis were lower than normal values with regard to factors affecting QOL including age, gender, economic status, unemployment, duration of treatment, and accompanying diseases [18]. These findings, even though the study was carried out in a different cultural background, are similar findings in the present study. In the study by Jastrzebski et al., mean QOL scores were low in patients with lung involvement including pulmonary fibrosis, chronic obstructive pulmonary disease, or tuberculosis. Moreover, the mean QOL scores in tuberculosis patients were much lower than those suffering from other chronic pulmonary diseases [14]. The study by Guryleva and Gerasimova evaluating and comparing QOL in 29 TB patients to QOL in 20 healthy individuals concluded that QOL in TB patients was impaired in the 3 dimensions of physical function, physical status, and emotional condition, with a larger impact noted in patients whose course of treatment was completed. Thus, it has been argued that tuberculosis as a chronic infectious disease could undermine QOL during and after treatment; indicating that monitoring QOL with the right tools could be part of the follow-up of treatment and care for these patients [19]. In the present study, the dimensions of emotional and social functioning had the lowest mean scores, underscoring the importance of emotional and social functioning in these patients since TB was a transferable disease and people in communities tend to communicate less with infected individuals as manifested in their social situations.

In the study by Marra et al., QOL was evaluated using the SF-36 questionnaire in two groups of patients: Patients with active tuberculosis (110 individuals) and patients with latent TB (100 individuals). The mean QOL scores in patients with active TB were significantly greater than those with latent TB in the majority of QOL dimensions. Similar to our study, QOL in patients decreased over the course of treatment. In the study by Ramkumar et al., although the mean QOL scores in TB patients were as low, DOTS appeared to improve QOL scores almost to the level of the general population [20].

Chama and colleagues compared QOL in 102 TB patients via DOTS with 103 healthy individuals using the SF-36 questionnaire. The results revealed that QOL in TB patients was lower than in the general population in all dimensions, especially social functioning, physical function, and mental health,. Furthermore, patients with more clinical symptoms,

[2] Short form

Table 1
Mean ± SD scores of the 8 dimensions of QOL in TB patients undergoing DOTS.

Quality of life dimensions	Mean SD
Physical function	65.08 ± 8.27
Limited physical activity following mental problems	63.58 ± 20.10
Limited physical activity following physical problems	91.91 ± 14.91
Vitality and fatigue	67.11 ± 12.57
Mental health	66.25 ± 9.62
Social functioning	62.82 ± 15.2
Bodily pain	72.8 ± 16.55
General health	65.92 ± 17.12
Total score of quality of life	61.125 ± 12.94

Table 2
Comparison of the mean ± SD of QOL total score in TB patients undergoing DOTS base on gender, place of residence, type of TB and stage of treatment.

Factor	Means ± SD of QOL		Independent *t*-test results
Gender	Female	male	*p*-value < 0.02
	58.58 ± 13.06	54.12 ± 9.76	
Place of residence	urban areas	rural areas	*p*-value < 0.001
	59.18 ± 10.26	54.58 ± 9.06	
Type of TB	Extra-pulmonary TB	Pulmonary TB	*p*-value < 0.05
	55.28 ± 8.46	61.58 ± 12.06	
Stage of treatment	The first stages of treatment	The final stages of treatment	*p*-value < 0.031
	63.36 ± 9.26	60.48 ± 11.26	

leukocytosis, and older age had lower QOL mean scores. Similar to the findings by Ramkumar et al., mean QOL scores in TB patients increased during the third and the sixth months of treatment [21]. The increase in QOL scores in the course of treatment in these 2 studies differs from findings from the present study, but was an important finding.

Dhingra et al. conducted a study at the Tuberculosis Center in New Delhi, India on 75 patients with pulmonary and extra-pulmonary tuberculosis receiving DOTS in which QOL was evaluated at the beginning and at the end of treatment using Health-Related Quality of Life Questionnaire (HRQLQ). At the beginning of treatment, there was no statistically significant difference in mean QOL scores between patients with pulmonary vs. extra-pulmonary tuberculosis, although their mean QOL scores were lower than those in healthy individuals. At the end of treatment, the mean QOL scores in patients with pulmonary tuberculosis were significantly higher than in patients with extra-pulmonary tuberculosis [22]. These findings are in contrast to findings from the present study.

In the present study, the mean QOL scores in rural patients were lower than those living in urban areas possibly due to a low level of knowledge, lower economic status, and inadequate level of nutrition Carroll and colleagues at the Tuberculosis Research Center in Vancouver evaluated QOL in 84 TB patients; 62% were male and 38% female. The mean age was 46.2 years, 28% of the patients were reported co infected with HIV, 18% hadhepatitis B, 23% of them were diagnosed with alcohol use disorder, and 34% had no full-time jobs,. The mean QOL scores in patients living in rural areas, those with accompanying diseases especially HIV/AIDS and hepatitis, individuals deprived of family and social support, and patients with insufficient knowledge of their disease were lower than other individuals in their groups [23]. Therefore, it was concluded that Accordingly, health care providers as well as medical and health care giver were required to pay much more attention to QOL in patients as a monitoring tool evaluating medical care and treatment respond along with prescribing medications.

5. Conclusion

Various factors threaten QOL of patients with tuberculosis in the course of infection, during and after treatment. Monitoring quality of life should be part of the evaluation of response to long term treatment and medical care for patients with tuberculosis. A negative impact on various domain of quality of life, including social and mental domains, during the long-term treatment of tuberculosis has been noted. Paying attention to quality of life in the care of patients could help minimize this damage and facilitate the return of patients to their communities.

Conflict of interest

None.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jctube.2019.100093.

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